I THE BLIND DEAF II MEDICAL FACTS

TAD CHAPMAN'S DEMONSTRATION

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I. The Blind Deaf. II. Medical Facts

SUPERINTENDENT THOMAS RODWELL, of the Manitoba School for the Deaf, Winnipeg, presided at this session, which was held in the auditorium of the State Teachers' College, Friday afternoon, July fourth. He opened the meeting by calling on Miss Sophia Alcorn, of the Detroit Day School, to give a demonstration of her work with Tad Chapman, a blind-deaf boy fifteen years of age who was formerly her pupil.

Tad Chapman's Demonstration

MISS ALCORN prefaced her demonstration by a brief history of Tad's case. He was a perfectly normal child until the age of four, when meningitis deprived him of both sight and hearing. Soon his speech disappeared also. This was in the spring of 1919.

During parts of two sessions at the South Dakota School he was taught for brief periods daily by two teachers with no experience in teaching the blind-deaf. Miss Alcorn began to teach him in January, 1921. At that time he had no speech, and Miss Alcorn, who had worked out some theories of her own in previous experience with a deaf-blind pupil, began at the very beginning. She taught him to understand speech by means of vibration and to speak elementary sounds, recognizing them from sand-paper letters. At the end of three years he had made as much progress as the average deaf child makes in that length of time, and had an unusually pleasing voice.

Miss Alcorn left South Dakota in January, 1924, and during the next year and a half Tad forgot all that he had learned. Then Miss Alcorn returned to the school as supervising teacher, and Miss Margaret Grady took charge of Tad under her supervision. Miss Grady taught him for three years, during one of which he was sick most of the time. Then Miss Hall became his teacher and has had him for two years. Miss Alcorn expressed admiration of the excellent work done by both of these teachers. Tad is now doing sixth year work according to the North Carolina outline.

Many people, Miss Alcorn said, avoid contact with the deaf-blind who communicate orally because they do not like to have hands placed on their lips. In teaching Tad she had found that this was unnecessary, that he could understand by placing his hand on the face, instead of the lips. Miss Alcorn then walked over to Tad's chair on the platform, placed his hand on the side of her face and asked him whether he wanted to stand up. He arose immediately, and carried on a conversation with her with little or no apparent effort, though she had not seen him for three years until that morning. His voice, though "deaf," was of pleasant tone, and his speech was readily understood. He answered such questions as the following:

Who is the mayor of Milwaukee?

Mr. Hoan.

Who is the governor of Wisconsin?

Mr. Kohler.

How long was Admiral Byrd in the Antarctic region?

More than a year.

When was the London Naval Conference ended?

London Naval Conference ended April seventeenth.

How long did it take Captain Hawks to fly across the United States?

Six and one-half days.

Miss Alcorn then placed a sheet of paper between Tad's hand and her face, and asked him a series of questions in geography, which he readily understood and answered.

She then added two more sheets of paper, and found that he could still understand.

At this point someone requested that in order to bear out the fact that Tad had no hearing, Miss Alcorn remove her hand from his face and speak to him. She did so, but got no response. She said that she believed he had no hearing whatever, and Mr. Tillinghast, Superintendent of the South Dakota School, added, "We have never been able to detect any hearing at all."

Miss Alcorn then said, "He can stand across the room from the radio, hold an empty tin can in his hand and tell the time of the music being played. He can tell whether a man or a woman is singing by touching the radio." She then placed a thirty-page pamphlet between her cheek and Tad's hand and asked him simple questions. He found it difficult to understand in this way, but was able to answer the questions with some repetition.

Mr. Tillinghast then spoke briefly as follows: "I should like to say a word about Tad and the manual alphabet. A great many people think it is absolutely necessary for the deaf-blind to know and use the manual alphabet. I confess that when I first took charge of Tad I was inclined to think so, too. Sooner or later he will no doubt learn it, but so far he seems to have had absolutely no use for it, either at school or in communication with his parents, who are in close touch with him all the time. We have made tests and found that we could go far more rapidly with speech than is ever possible by the use of finger-spelling. He goes with his attendant to church, and can get a good deal of the sermon simply by having it whispered to him, not disturbing the congregation at all."

Upon an inquiry from the audience as to Tad's ability to understand an unfamiliar word, he was given an opportunity to feel the reporter's stenotype machine and was told its name. He repeated the word "stenotype," and when asked by Miss Alcorn to spell it, he did so. She then asked him if he knew the word "catalogue." He said he did not. Miss Alcorn spelled it and he repeated it rapidly after her.

Miss Alcorn closed the demonstration by saying that she believed we were just beginning to learn what vibration was capable of doing for the deaf—that her class in Detroit, with perfect sight, could understand by vibration just as Tad does, and had better voices than they would have had without vibration work.

Chairman Rodwell next introduced Miss Corinne Rocheleau as one of the authors of the new book on the blind-deaf, "Those in the Dark Silence," published by the Volta Bureau.

The Deaf-Blind

By CORINNE ROCHELEAU

WHEN an assembly sees an unknown speaker mount the steps of a rostrum, certain definite questions are in all minds: Who is this speaker? What has she done? Why is she here? . . . And this usually brings forth an introduction, an explanation or an excuse. . . . While grateful to Mr. McManaway for the privilege of addressing you on a subject close to my heart, I feel like excusing myself for venturing to address you at all, having been brought up with the old-fashioned notion that a woman's sphere is the home. However, having as yet no family of my own, I have gravitated naturally to the subject most fascinating to a childless woman—other people's children, and thence to a more specialized field, that of the welfare of the deaf-blind.

The old saying that "a fellow-feeling makes us wondrous kind" may explain in

part my interests in these most unfortunate and most neglected of human beings; not that I have ever been blind myself, or neglected, or that I consider myself in any way unfortunate; but the deafness that was my portion from early childhood gave me a keen understanding of the trials and tribulations not merely of the deaf but of all the physically handicapped. Later on, in my Montreal convent-school, I came in close contact with a deaf-blind girl, the most pitiful, the most neglected and the most difficult of the hundreds of cases I ever had knowledge of. The story of this young girl, Ludivine Lachance, and of her education I later wrote in French. (And right here it may be well to add that although part of my education was obtained in a French convent, I am American-born and bred, and my own country comes first with me always.) While preparing the manuscript of this French book, the desire to know more about the deaf-blind and to be able to substantiate what I said about them led me to undertake a survey of the United States and Canada. The results were so surprising and the search led me so far that after my book came out I joined forces with another research-worker in this very specialized field, Miss Rebecca Mack, of Cincinnati, who has become my devoted partner and collaborator.

Miss Mack has always taken a deep interest in the sightless, and for years has been one of the most tireless social workers among the blind of her own city. A friendship of long standing with Helen Keller fostered in Miss Mack a desire to devote herself to the deaf-blind. Acting on Helen Keller's suggestion, Miss Mack attended, during a period of eleven years, all sorts of courses on special education at the University of Cincinnati, supplemented by close association with several deaf-blind persons, to one of whom she gave lessons during a period of two years. This, then, is the efficient collaborator who completed with me a continent-wide survey. The results of this survey and of our own personal experiences in the little-known field of the deaf-blind are contained in our joint book, *"Those in the Dark Silence,"* which has just been brought out by the Volta Bureau.

Miss Mack and I have not only been ferreting out hundreds of cases through correspondence with city, State and national authorities, or directly with deaf-blind persons, or their families, we have also personally known thirty-four deaf-blind persons, thirty-one of whom are now living; with many of these we have had long and close associations. Furthermore, the past winter and spring I have spent in study at my old convent-school in Montreal, where there is today the largest class of deaf-blind pupils under one roof, at least in America. This class is composed of ten women of various ages, from twenty-five to sixty, eight of these being re-education cases—deaf or deaf-mutes gone blind—and two having been, until their admittance at the school, without any previous education. After seven months of daily contacts with these deaf-blind students and their teachers; of seeing them at study and at recreation, or at work at various handicrafts; of sharing the life they led, their joys and sorrows, their thoughts, fears, hopes, desires; even of witnessing their "tantrums"; of having the teachers tell me of their difficulties and successes, I am better able than ever to understand the problems that face the teachers of the deaf-blind as well as the deaf-blind themselves. Lastly, I wish to say that some years ago, while in Europe, I was privileged to spend a few days in the famous school for the deaf and the blind at Larnay, near Poitiers, in central France. In this school the two sisters so much written about, Marie and Marthé Heurtin, received their education, as also many other deaf-blind girls. At the time of my visit, although the summer vacation had begun, four deaf-blind girls were still in attendance and I was thus permitted to see for myself something of

what has been accomplished for the deaf-blind on the other side of the ocean. And here I wish to add that Europe has long been in advance of America in providing adequate facilities for the education of the deaf-blind. There are five special schools for the deaf-blind on the European continent, and not one in the United States.

President Hoover, that great advocate of child health and protection, has written a child's "bill of rights" in which he says that:

The ideal to which we should strive is that there should be no child in America:
That has not been born under proper conditions.
That does not live in hygienic surroundings.
That even suffers from undernourishment.
That does not have prompt and efficient medical attention and inspection.
That does not receive primary instruction in the elements of hygiene and good health.
That has not the complete birthright of a sound mind in a sound body.
That has not the encouragement to express in fullest measure the spirit within which is the final endowment of every human being.

This is indeed a great ideal, one worthy of our striving to attain; but many years must necessarily elapse before we can reach that millennium in child welfare; and even if it be finally brought about, there still will remain what might be called the *casualty list*: the victims of heredity, of contagion, of epidemics, of accidents.

That humanity's casualty list is a terrible one today everybody realizes; but what few realize is the place held by the deaf-blind on that woeful register. Nearly seven hundred living cases have been uncovered in the United States and Canada, and of these, about one hundred are children or adolescents. There must be many times that number actually existing.

R. C. Williams, director of Research, Department of Public Instruction, State of Ohio, has said, "Perhaps one of the most serious problems to be faced in any extensive campaign of special education is the attitude taken by the parents. In our survey work we are finding it difficult to determine the number of handicapped children not attending school because of deliberate attempts to keep these children from being reported." The problem faced by Mr. Williams in Ohio is the same as the one we have faced, Miss Rebecca Mack and I, in our country-wide survey of the deaf-blind. In many cases, we had to apply again and again for information, sometimes enlisting the aid of various officials; and more than once the information requested, even the name of the child, was refused us.

Yet how can any special child, any handicapped child, be helped at all if he be not reported, studied, tried out and classified? It will be only through the reporting of all special children, of all physically handicapped children, of all children supposedly deficient mentally, that all deaf-blind children can be found and cared for. One would think that the combined infirmity of deaf-blindness is one so terrible as to be immediately apparent, but such is not the fact. There are border-line cases where deafness and blindness are not complete, yet quite sufficient to partly paralyze mental development; and there are baffling cases where a child may be adjudged idiotic when he is only mentally quiescent from double or triple physical infirmities aggravated by neglect, which fostered idiotic symptoms.

In spite of the growing interest shown on every side in the handicapped child, there are still millions of misguided people prone to consider the physically handicapped child as more or less feeble-minded. The special child is not necessarily feeble-minded, far from it. He can have a very fine mental content. What should be better understood is that the special child's mental powers may be temporarily obscured by unalleviated

physical infirmities and unfavorable environmental influences.

Educators and members of the medical fraternity must learn to search for the spark of latent intelligence in such cases; must even, when that spark seems absent, put by all preconceived notions, all set rules, all normal intelligence tests, and get down to the bedrock of personal observation and patient trials over a more or less extended period.

And speaking of intelligence tests, let me stress here, as Miss Mack and I have done before, the utter unreliability of the intelligent quotient, especially when applied to the deaf-blind. This so-called foot-rule of intelligence, even when tried on physically normal children in the public schools, has drawn the following scathing comment from William L. Phinney, president of the Boston Elementary Principals' Association:

One of the pitiful things is that the idea of the intelligence quotient is entirely oversold. For instance, a certain girl found "a moron" by these tests later completed with ease another kind of test that would be difficult for a normal person to answer.

If such things can happen in the application of these set rules to the usual run of normal children, what then can be the lamentable results when these mental weights and measures are tried on beings doubly or trebly handicapped, who have, moreover, been more or less neglected, more or less left to vegetate? . . . Human beings are not run in a series of molds, like the standard parts of a Ford car, they are infinitely variable; they are also variously susceptible to physical disequilibrium. In the delicate and complex organism of man, the many functions are interdependent upon each other. It is only when the various functions work harmoniously that we consider a human being normal. Serious disturbances in any of the physical functions necessarily result in corresponding disturbances of the mental functions or in their retarded development. It is only by restoring the delicate balance that normality can be arrived at. When, however, the physical disturbances are of such kind and degree that perfect equilibrium cannot be restored, the only recourse is to train one faculty to take the place of another; to develop the inner consciousness, the will, the soul in short, which in the last analysis is the most powerful of human levers, the driving force to which both body and mind respond.

This brings us to the subject of education. The whole problem of public education in the United States stands on the principle of equality of opportunity for all children. Again quoting Mr. Williams, we agree with him that if the handicapped child is to have his chance at all,

His physical and mental condition must not be lost sight of. The school plant, its materials of instruction and methods of teaching, must be fitted to the child. Such cases need far more individual attention from the teacher than normal children require, calling for smaller classes and an increased *per capita* cost. These smaller classes require separate rooms and special equipment, and teachers who, through specialized training, beyond that necessary for normal children, are competent to appreciate the processes by which these unfortunates must receive an education.

We will add that these teachers should also possess a flexibility, an independence, a resourcefulness that will prompt them to frequently lay aside all set programs and to seize educational opportunities as they present themselves, making use of the instincts and emotions of the child, as they are seen to arise, as stimuli to mental activity.

It is well-nigh impossible to systematize the training of these handicapped beings, so variable in the nature and degree of their handicaps.

As a matter of form, we generally classify them as follows:

Totally deaf and blind
Blind and hard of hearing
Deaf and partially blind
Partially blind and hard of hearing

All those with a residue of sight or hearing have a definite tendency to grow totally deaf and totally blind in time. Then we must further differentiate between

Congenital cases
Cases of deaf-blindness occurring in early childhood
The deaf who grow blind in adolescence or maturity
The blind who grow deaf in adolescence or maturity
Cases of normal adolescents or adults who become partially or totally deaf and blind through illness or accident.

All these various types call for various methods of education; and as physical health, mental content, and natural disposition are also variable the processes of education vary *ad infinitum*. We have checked up a dozen different ways of conversing with the deaf-blind: oral method, manual alphabet, sign language, Morse code, alphabet glove, alphabet plate, Braille used on fingers, etc. And there are as many modes of reading and writing in use, while again some of these methods are subdivided into many modes: for instance, Tad Chapman understands oral speech in nine different ways. Many educators of the deaf-blind think that most of these methods should be discarded and the processes standardized. But that would necessitate standardizing the deaf-blind themselves, and anybody who has known a number of deaf-blind persons knows full well that hardly two of them will respond to exactly the same methods.

The only solution to this complicated problem would be to have a sort of educational workshop, an institution in which many different methods could be tried in succession in difficult cases, all methods given a fair trial and the results obtained filed for future reference. It must be borne in mind that here, more perhaps than anywhere else, circumstances alter cases, and that even the best methods are not always best with certain subjects. This fact was sharply brought home to me a few weeks ago when I met—it was not the first time—a deaf-blind girl who has been taught both the oral and manual methods but nearly always insists on using the oral method only, which in her case entails the use of one of her hands on the lips of the speaker. In previous meetings, I had submitted to this sort of conversation, although I did not like to see those fingers of hers flitting from face to face and returning to mine. However, I suddenly stopped all this on learning that the girl had been a syphilitic case, although the germs had not been active for many years. I do not wish to intimate that most deaf-blind persons are carriers of contagious diseases: on the contrary, our records seem to prove that the majority of them are free from contagious ailments of any kind. The point is that one can never know when one meets such cases and therefore it is imperative that the speaking deaf-blind—and all should be taught to speak whenever possible—should also be familiar with some other and less objectionable way of understanding those who speak to them. This illustrates but one of the many problems faced by educators of the deaf-blind.

Yet there are compensations even in this arduous field. The results obtained generally repay the teachers, since teachers, like medical men, are an altruistic lot, more interested in the progress of humanity than in the ease of their own lives and the filling of their private coffers. Examples of shining success in this most difficult type of education are not hard to find among our records: I may name here Miss Sophia Alcorn, of Michigan, who obtained unprecedented success in the teaching of the oral method to Tad Chapman. There is Miss Nettie Newell, of Indiana, whose record in the case of Jess Liston is also extraordinary, considering the fact that young Jess was *born*

deaf, dumb, blind and without sense of smell, one of the very rare congenital cases with this quadruple affliction, yet otherwise normal mentally and physically; there is Miss Foley, of Pennsylvania, who made of Kathryne Frick a creditable student, an interesting writer, and a sensibly-minded happy girl, no mean achievement for a deaf-blind person; there is Miss Mamie Heflybower, of Texas, veteran teacher of the deaf-blind, to whom eight or ten such unfortunate children have been given for training, at least a half dozen of whom she has made into as creditable pupils as can be shown anywhere; there is Miss Ada Lyon (now Mrs. Cureton) of Ohio, and her brother, the late Robert J. Lyon, who made of Leslie Oren a happy, normal boy who grew into a happy, normal man (insofar as his physical handicaps permitted), a man whose mental attainments are truly astonishing, who carries on alone his studies in several languages, years after leaving college, yet who is no way top-heavy, keeping his hands busy, too, at manual crafts that net him a goodly part of his living expenses.

Of course the training of the deaf-blind, the most specialized and individualized of all types of education, is necessarily very costly, the more so as the cases are isolated, scattered over an entire continent. The question of cost, however, could be partly met if the various States would provide funds to assist existing schools for the deaf and for the blind in meeting the difference between the cost of this very special education and that of merely deaf or blind children. Another way to deal with this problem would be to provide itinerant teachers who would give individual instruction in the homes of the pupils. But neither means would cover the entire field nor solve all the problems of the deaf-blind, whether they be children or adults. What is needed, and that badly, is a central institution for the welfare of the deaf-blind in general. To this educational center, all baffling child-cases could be sent for special observation and classification by a corps of qualified teachers, these children after a more or less prolonged stay, to be sent back, whenever possible, to schools for the deaf or blind in their own home states. Children not acceptable in such schools, or in whose states no provision were made for such specialized education, would be educated entirely in the deaf-blind center. To this center also would come adolescent and adult deaf-blind of every kind and degree: deaf people going blind, blind people becoming deaf, people hitherto normal but suddenly afflicted with deaf-blindness through illness or accident. For this problem of the deaf-blind is manifold. It is not merely one of primary education, but also of re-education, of rehabilitation, of vocational guidance, of the maintenance of morale. If we are not ready to do all these things for the deaf-blind, we do them but a half-service, we cut them adrift in a social and industrial whirlpool where normal and well-equipped individuals so often go down.

By having a special institution properly equipped and with a highly trained and sympathetic staff, we could adequately deal with the various problems of primary education, vocational training or guidance, re-education, rehabilitation and after-care. The problem of proper medical treatment could also be more easily solved since skilful specialists would be regularly called in, thus accumulating invaluable data and experience, profitable to the medical fraternity as much as to the deaf-blind patients. In short, this deaf-blind center would provide continuity and permanence in training and guidance. It would act as a clearing-house for everything pertaining to the deaf-blind of the nation: parents could find out what to do for deaf-blind children; schools and institutions everywhere could send to it doubtful or difficult cases; adolescents and adults could find proper schooling in whatever sort of specialized

knowledge they needed to readjust themselves to strange and difficult situations, as well as vocational training and guidance to keep them busy, diminish discontent and fit them to earn at least a part of their living. The residue of afflicted persons unreclaimable in other ways could be adequately provided for and placed. Such an institution would not be duplicating the work done by institutions for the blind and the deaf but would co-operate with them, filling a need these institutions feel more and more.

We hope to see such an institution take form some day, and grow, and make its influence felt to the four corners of our great country, and even beyond it; to see the deaf-blind come groping towards the safe haven created for them with the blessed certainty that therein they will find answers to all their doubts, help for all their troubles, alleviation for all their miseries; and, best of all, that moral support, that incentive to courage which will enable these most sorely-tried of human beings to face life without visibly flinching, without hurling themselves in despair at the gates of their everlasting silence and their everlasting darkness.

Time did not permit the discussion of Miss Rocheleau's paper, and Chairman Rodwell immediately presented the next speaker, Dr. Hagens, of Chicago, who had recently had experience as a member of the National Research Council's medical survey staff in schools for the deaf.

Some Facts Obtained in a Survey of the State Schools for the Deaf

By E. W. HAGENS, M.D.

IN January, 1924, at a conference of superintendents and principals of the schools of the deaf it was recommended that a thorough survey of the schools be made. The late Dr. C. W. Richardson was given charge of the physical survey of the deaf. Dr. Richardson obtained financial aid from the National Research Council through a grant by the Laura Spelman Rockefeller Memorial. Dr. Shambaugh was placed in charge of supervising the work of examining the children in the Middle West, and finally of all the schools to be examined. As a result several of us have examined 5,348 children in the schools for the deaf. The schools surveyed included: Illinois, Missouri, Iowa, Indiana, Ohio, Western Pennsylvania, Mt. Airy, Michigan, Minnesota, Wisconsin, New Jersey, and the day schools in Chicago and New York.

The examinations which we made included a physical examination of the ear, nose and throat of the children, and the testing of their hearing and vestibular mechanism. With the histories obtained from the school offices and the data of our examinations, the results were worked up in the form of tables and charts. A study of the results reveals a number of facts which are of interest to those working with the deaf. We are well aware of the various errors which creep into a study of this type, but with such a large number examined it is hoped that a certain number of errors will equalize each other.

For the sake of convenience the children were divided into two main groups: (1) those who were born deaf; and (2) those who acquired their deafness. Taking up the first group (the congenital), it was

found that over 3,000 children, or 62 per cent, were deaf at birth. This would mean that the congenital group outnumbers the acquired approximately 3 to 2. In view of the fact that the average parents would rather state that their child was not born deaf (for fear of reflection on themselves), it would seem that the number diagnosed congenital was probably correct, at least the error would lie in the direction of not getting all of them. A certain number of the children classified as acquired gave histories of injury or infection during babyhood and more than likely some of them were born deaf, but because of a severe cold or accident the cause of the deafness was attributed to an acquired factor.

Of interest in the congenital cases is the question of heredity and consanguinity. We found almost 1,400 such cases out of the total congenital group of over 3,300—a percentage of 41, or slightly less than one-half. Thus intermarriage and heredity appear to be important factors in congenital deafness. There were 112 instances of marriage between first cousins, 64 instances between second cousins, and other relationships less frequently. In these cases of consanguinity or intermarriage about one-half had several children born deaf, while in the other half the child examined was the only deaf child in the family. Deafness in the families of the children showed the following: parents born deaf (one or both), 144 instances; aunts deaf, 126 instances; uncles deaf, 112; cousins, 175; grandparents, 40; and others, 59. The surprising finding here is that, of over 3,300 children classed as congenitally deaf, in only 144 instances were the parents born deaf. It was frequently found that more than one child in a family was deaf. Almost 500 children had a brother or a sister also deaf; in six instances there were 5 other children also born deaf; while 17 cases of deaf twins were encountered. A detailed study of this part of the work or another survey of these particular children would be extremely interesting. A number of interesting families were encountered, teachers in each school pointing out the line of deafness running through the several generations.

In regard to the degree of deafness of the congenital cases, our classification was based on partial or total deafness to the tuning fork tests (including the voice). For comparison and for the sake of completeness these results were checked by the 2A Western Electric audiometer. It should be stated that we have not used the term, hard of hearing, as used by teachers of the deaf. To us these children are either partially deaf (where they have remnants of hearing), or totally deaf (where the deafness is complete). To state whether a child is totally deaf or not may depend entirely upon what tests are used, whether it be the voice, the tuning forks, or the audiometer. We found in these congenital cases that the results of the voice test gave the largest percentage of totally deaf, the fork tests showed almost 40 per cent, whereas the audiometer brought out a number of remnants of hearing so that only approximately 14 per cent were completely deaf.

In the discussion of the congenital cases the site of the aplasia or mal-development of the ear has to be considered. We were surprised to note the relatively few children showing deformities of the outer ear. In most instances the auricle, external auditory canal, the drum membranes and the external configuration of the mastoid bones appeared normal. It seems likely then, that in the majority of the cases, that the inner ear or the nerve of hearing is the seat of the maldevelopment. Lately, in a few selected children we have had the mastoids X-rayed, and, as far as the work has gone, the pictures have shown quite normal mastoid development. Finding such normally developed mastoids, along with the normal drum membranes, would lead us to believe that the middle ear proper was normally devel-

oped. This then confirms in these cases the belief that the mal-development exists in the inner ear.

In considering the second group of cases (the acquired) it was found best to divide them into: (1) those who developed deafness with middle ear abscess (otitis media), and (2) those who became deaf without such infection. Each of these classes was also divided into (a) cases of total deafness, and (b) partial deafness. Perhaps one of the most important things in regard to the acquired cases is the question of what conditions or diseases produce such severe deafness that the children must be placed in special schools for the deaf. The results showed that epidemic cerebro-spinal meningitis caused 19 per cent of the cases and is by far the most important disease in acquired deafness. Measles accounted for 8.5 per cent, influenza and scarlet fever each about 7 per cent, middle ear abscess and mastoid infection 6.6 per cent together, pneumonia 5 per cent, fall and skull fracture 5 per cent, whooping cough 3.5 per cent, infantile paralysis 3 per cent, fever (?) 2.5 per cent, mixed infections 2.1 per cent, diphtheria 1.7 per cent, typhoid fever 1.6 per cent, syphilis 1.3 per cent, and other conditions much less frequently. In regard to fall and skull fracture we feel that the percentage recorded is probably much too high and that the histories given by the parents were probably not very reliable. In some instances we discounted the histories given entirely, in others they were recorded, but cannot be considered as accurate. In the main it is seen that meningitis, measles, scarlet fever, influenza, and pneumonia are diseases which produce the greatest damage to the organ of hearing. It has usually been assumed by the laity and often by doctors that most of these diseases produce deafness by causing middle ear abscess. Our results, however, show this to be far from the truth. Of the total number of acquired cases, in only 24 per cent was there an associated otitis media. Of the diseases mentioned scarlet fever gave the highest number acquiring deafness with middle ear abscess, and here the percentage was only 42 per cent. All of the remaining cases, therefore, became deaf by way of toxic infection of the inner ear or nerve of hearing. This finding has an important practical bearing. It has always been felt that deafness could be prevented by early local treatment to the ears. But when the inner ear is involved this is impossible. The only solution, then, is to prevent the disease or or be able to cure it in its incipiency. We have been able to treat diphtheria by means of anti-toxin for some years, lately this type of treatment has been used in scarlet fever, and perhaps in the future all of the diseases may be so treated. Meningitis has its serum, but success has not been as uniform as might be hoped. Therefore, it is apparent that prevention of these diseases is the essential point. It would be well for every teacher, every parent, and every doctor to be aware of this. If it were possible to prevent these diseases we would then prevent most of the cases of severe acquired deafness.

The table showing the age at which the deafness was acquired reveals the fact that 61.7 per cent became deaf by the third year of life. By the fifth year 78.8 per cent had become deaf. Only 10.4 per cent developed their deafness between the ages of five and ten. How very important then, are the first five years of a child's life! It is during the pre-school years, when the child is still at home under the parents' care, that the child's health should be particularly safeguarded. There are still hundreds of mothers who believe the younger child should be placed in the same room with the sick older brother or sister in order that it may catch the infection and have it over with. The older child is usually better able to fight off the infection and may have a light attack, the younger one, given the disease

wilfully, may become stone deaf as a result.

The degree of deafness in the acquired cases was based on the same type of examination as for the congenital. Deafness to the voice gave the highest percentage of total deafness. To the tuning fork tests 40.8 per cent had complete loss of hearing, while the other 59.2 per cent showed remnants. These figures are practically the same as for the congenital group.

Study of other of the tables reveals some of the more general facts. Tabulation of the sexes showed that the boys predominated slightly in both the congenital and acquired groups. It has been stated that boys tend to predominate slightly in the acquired cases because of their greater freedom and that girls have generally been found to predominate in the congenital cases. From our results sex would seem to play a very unimportant role. We attempted to determine whether nationality bears any influence. It seemed best to record the birth place of the child's parents. A child may be born in the United States soon after its parents have emigrated here, but if the parents continue to live as they did in their own country, the factors which might have an influence on the child's loss of hearing would be related to the conditions of the foreign country more than to the United States. The tabulated results do not seem to indicate that race has anything to do with deafness. It was evident that the predominance of a nationality depended upon what part of the country the schools were situated in. The chart upon tonsils and adenoids in relation to ear changes showed that about one half of the children had had their tonsils and adenoids removed. These children had just as much ear involvement (infection and deafness) as the group who had not had the tonsils taken out. Many children had their throats operated on to relieve the deafness, which, of course, was futile, especially in the congenital cases or in those with acquired deafness where the inner ear was destroyed. Tonsils and adenoids should be removed in deaf children when they are causing trouble, just as in hearing children. But the deafness which is severe enough to cause a child to be placed in a school for the deaf is never relieved by operation on the throat. Examination of the nose did not reveal changes which could be said to be peculiar to deaf children.

It has been believed by some that syphilis may be a greater causative factor in deafness than has been suspected. In view of this we had 400 children in one of the schools examined by the blood Wasserman test. In this school the congenital and acquired cases were approximately equally divided. The results showed only two positives. This coincides with our impression in the other schools—that there may be one or two children who have congenital syphilis. These are usually easily diagnosed from the history and the physical examination. Syphilis does not appear to be an important factor in these cases as far as our results have gone. However, were it possible to obtain blood and spinal Wassermans on the children and also upon their parents the conclusions might prove different.

A brief statement as to the testing of the hearing with the audiometer should be made. We found that the audiometer revealed remnants of hearing that the tuning forks did not. These remnants, when they are in the speech area, may be of use. The results showed that when remnants are found they are either: (1) below 2,000 d.v. or (2) both below and above 2,000 d.v. In practically no case were the remnants above 2,000 d.v. alone. The remnants are, therefore, in the speech area. They are frequently very slight, however, and it has seemed doubtful whether they could be utilized. Recently I have been told that it has

been found possible in one of the schools to make use of our audiometer records showing the remnants of hearing. Perhaps developments will occur so that teaching will be greatly aided. The audiometer records are also of importance in that a child's hearing may be checked from time to time and improvement or loss of hearing fairly accurately noted. On the other hand, we do not think it wise to use the audiometer for making a diagnosis of the type or cause of deafness. It is true that one can give a percentage loss of hearing for a given tone, or an average of a certain number of tones. But supposing a child heard the lower four tones of the 2A audiometer (mainly the speech area) and did not hear the upper four. Would the child have 50 per cent loss of hearing? For the eight tones he would, but from a practical standpoint of useful hearing he would not. If the percentage loss of hearing is to be mentioned one must understand how the figure is arrived at.

The tests which we carried out on the vestibular part of the ear are of perhaps more interest to physicians. However, the turning chair and the cold water test caused considerable interest and excitement during the examinations. These tests were made to determine whether the equilibrium part of the inner ear was intact, partly damaged, or totally destroyed. Such findings are an aid in the diagnosis as to the type and cause of deafness. Of more general interest is the fact that children whose equilibrium is lost are not made sea-sick or car-sick as are other children. The laity frequently believe that this is true of all deaf children, but it is only so in those where the aplasia, or in the acquired cases, the disease has affected both the hearing and the vestibular mechanisms. We were interested in determining whether the children without vestibular reactions were handicapped in the rhythm or musical exercises. Unfortunately the data were not sufficiently worked out for us to be able to judge on this point.

The equilibrium part of the ear consists of the saccule and utricle in the vestibule, and the three semi-circular canals. It is the semi-circular canals mainly that we are able to test by the turning chair and the cold water tests. The canals function normally by maintaining equilibrium and informing the brain as to the position of the body due to turning movements. Hence the disturbance produced by the turning tests results in an imbalance of the equilibrium and the child is conscious of objects moving around. When the mechanism is partly injured a partial reaction only is obtained. When it is totally destroyed no response occurs. It has been a clinical rule that children who were born deaf would have a vestibular response (the aplasia affecting only the hearing mechanism), while children with acquired deafness would have a loss of both the hearing and vestibular parts of the ear. In the acquired cases the disease usually sweeps over the whole of the inner ear, getting both mechanisms. Our results in the congenital group, however, show that 20 per cent of these children had no vestibular reactions. Hence such a rule cannot be used to make a definite diagnosis between congenital and acquired cases. In the acquired group there were 36 per cent showing an absence of response to the vestibular tests. This per cent is higher than for the congenital group, and is considerably augmented by the large number of meningitis cases in the acquired group. In the majority of instances in this disease the vestibular mechanism is totally destroyed. We had thought there would be a lack of response in all of these cases, but were surprised to find a definite number who had normal or diminished reactions.

Two of our tables concerned the relation of the speech of the children. In one of them, those children were listed whose

speech was unintelligible to us and in the other the children whom we could understand. It was thought that perhaps we would find those with marked speech defect showing total deafness and those with more normal speech, partial deafness. However, a number of factors were apparent. Those children who had had instruction in school for several years or more would have better speech, other things being equal, than a child that had just begun, and yet the latter might have much better hearing. In this way speech may be more a matter of training than one of hearing. Another factor is that some of the children were handicapped in other respects. Certain of the children had very poor eyesight, others were mentally backward. With these added afflictions a child's speech might easily be retarded. While, therefore, we have recorded our results in these tables I think it best to make no comment on them.

The tables concerning some of the hearing tests and several others relating to the caloric tests are too technical to be of interest. They are included in our final report which will appear in the *Archives of Otolaryngology.*

Conclusion

In order to crystallize some of the major points the following conclusions are given:

1. Five thousand deaf children in the state schools for the deaf were examined.

2. Three-fifths, or 60 per cent, were apparently born deaf, while two-fifths, or 40 per cent, acquired their deafness.

3. In the congenital cases 41 per cent had a history of inter-marriage or family deafness.

4. In both the congenital and acquired groups two-fifths were totally deaf to the tuning forks, while the other three-fifths showed remnants of hearing.

5. Of the acquired cases, meningitis caused 19 per cent, measles 8.5 per cent, scarlet fever and influenza each 7 per cent, and middle ear and mastoid infection 6.5 per cent together.

6. Seventy-eight per cent of the cases acquired their deafness by the fifth year of life.

7. The deafness in these acquired cases is produced by way of toxic neuritis or inner ear involvement in the majority of instances. Thus prevention of the disease is much more important than local treatment to the ear once the disease is established.

8. Syphilis seems a small factor in these cases.

9. Removal of tonsils and adenoids has no direct bearing on the acquired cases of severe deafness.

10. Nationality plays no part in these cases. The sexes are about equal, although the males predominate slightly in both the congenital and acquired groups.

11. The audiometer reveals many remnants of hearing not detected by the other functional tests. These remnants may be found useful in the teaching of the deaf.

Finally, as to what general practical value the survey has been: (1) while no definite cause for congenital deafness has been found, nevertheless several important factors have been noted—intermarriage and the marriage of congenitally deaf individuals incurs a definite risk of the offspring being born deaf; (2) in acquired cases much can be accomplished by prevention and this should be especially emphasized; (3) no cure for either the congenital or the acquired type of deafness, of the degree found in these children was discovered, nor would any such cure seem likely when the data of the survey (as just given) are considered; and (4) for those children who are now deaf and for those who may become so, education in the schools for the deaf is the very best that can be done for them.

The session closed with expressions of thanks to Miss Rocheleau and Dr. Hagens.

Business Session

THE business meeting of the Association was held at several different times, as certain reports were given as parts of other sessions. For convenience, however, most of the matters concerning the business affairs of the organization are grouped in these pages.

The President called the meeting to order and requested the Secretary to give a brief resume of the progress of the Association since the meeting in Staunton in 1928. Following this, the main facts presented by the treasurer at the meeting of the Board the day previous were summarized. The report of the Executive Secretary was then considered.

Report of the Executive Secretary

By JOSEPHINE B. TIMBERLAKE

I AM to talk to you today about the headquarters of your Association, and I hope you will pardon my attacking my subject from a personal viewpoint. I do so because I entered my work in Washington directly from a school for the deaf. I had spent seven years in this school and two others. My outlook was that of a teacher. It was as a teacher that I began to adjust myself to my new duties, and I still have the feeling of being a teacher—only trying to work in a slightly different field.

It was eleven years ago that I went to the Volta Bureau. I had been a member of the Association ever since I began to teach, had read THE VOLTA REVIEW with varying degrees of interest, and felt vaguely that the Volta Bureau was a place with plenty of money, and with a great many books in its library, which very wise people went there to read.

I was destined to receive some surprises—not to say jolts. First of all, I found that instead of having vast wealth and a host of workers, the Volta Bureau was employing only three persons besides myself, and that in times of special financial stress, the superintendent would refrain for several months from drawing his salary, to tide over the difficult period. (I might add, parenthetically, that it gave me a great surprise to discover that the members of the Board did not, as I had thought, always have their expenses paid when they attended Board meetings, nor when they attended the meetings of the Association in the summer time, and that many of the officers were hard pressed sometimes and had to make real sacrifices in the work they were doing to push forward the cause of the Association.)

I found even more of a library than I expected—not less than twenty thousand volumes, but

". . . each in his tomb
With his mouth dust-stopped."

No trained librarian, I learned, had ever worked among them, no analytical index of them existed. They were classified, but only in a crude and elementary fashion.

Early in my first year we were called upon for the addresses of schools in Europe. I knew that statistics had been collected in this field, and turned to them confidently—to find that no revision had been made since 1893!

I found that it was almost impossible to get good teachers' material for THE VOLTA REVIEW, but that it did not seem to matter especially, for no one seemed to notice or care whether it was good or bad. Teachers did not seem to know the difference between the Association and any other organ-